



Water Quality

What's in This Report?

This Annual Water Quality Report, prepared in cooperation with the California State Water Resources Control Board (State Board) - Division of Drinking Water, provides important information about Fresno's water supply, water quality, and water delivery system. Test results for Fresno's 2017 Water Quality Monitoring Program are summarized on the following pages. It is important to read the messages regarding various water quality issues from the U.S. Environmental Protection Agency (USEPA) and from your City of Fresno Water Division.

Unregulated contaminant monitoring helps USEPA and the State Water Resources Control Board to determine where certain contaminants occur and whether the contaminants need to be regulated.

FACTS ABOUT DRINKING WATER STANDARDS

Under the 1974 Safe Drinking Water Act, the United States Environmental Protection Agency and the California Department of Public Health were charged with the responsibility of setting and implementing safe drinking water standards. Congress reauthorized this act in 1996. There are 74 regulated contaminants and another 34 are subject to monitoring. Fortunately, only a small number have ever been detected in Fresno's water supply.

WATER CONSERVATION Outdoor Watering Schedule

The 3-Day Outdoor Watering Schedule is here. Through August 31, 2018, the 3-day outdoor watering schedule is in effect for all Fresno residents, as follows:

- Odd Addresses water: Tuesdays, Thursdays and Saturdays
- Even Addresses water: Wednesdays, Fridays and Sundays

No watering is allowed by ANY customer on Mondays and daily from 9 a.m. to 6 p.m.

For questions, contact Water Conservation at waterconservation@fresno.gov or call (559) 621-5480.

EYEONWATER Connect. Calculate. Conserve.

Introducing EyeOnWater -- a tool that allows Fresno customers to connect to their water utility accounts and view their latest water usage on their desktop or mobile device. EyeOnWater helps customers understand their water usage, detect leaks and discover their watering trends. Customers can quickly view recent water usage with a two-week comparison and view detailed water usage history by hour, day, week, month and year!

REGISTER NOW

Visit fresno.eyeonwater.com/signup or download the EyeOnWater app on your mobile device! You'll just need your utility account number to register. If you don't have a copy of your water bill, contact Utilities Billing & Collections at (559) 621-6888 to obtain your account number. For additional questions, contact Water Conservation representatives at (559) 621-5480.

SOUTHEAST SURFACE WATER TREATMENT FACILITY

The Southeast Surface Water Treatment Facility (SESWTF) recently completed construction this year, maximizing the use of surface water resources and ensuring clean, safe water for Fresno residents. Adding to Fresno's water portfolio, the SESWTF is being fed with surface water from the Kings River through a newly-constructed 13-mile long Kings River Pipeline. The SESWTF will be delivering drinking water to Fresno homes and businesses, reducing reliance on groundwater and alleviating groundwater depletion.

Nitrate: Nitrate in drinking water at levels above 10 mg/L is a health risk for infants of less than six months of age. Such nitrate levels in drinking water can interfere with the capacity of the infant's blood to carry oxygen, resulting in a serious illness; symptoms include shortness of breath and blueness of the skin. Nitrate levels above 10 mg/L may also affect the ability of the blood to carry oxygen in other individuals, such as pregnant women and those with certain specific enzyme deficiencies. If you are caring for an infant, or you are pregnant, you should ask advice from your health care provider.

Arsenic: While your drinking water meets the federal and state standard for arsenic, it does contain low levels of arsenic. The arsenic standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. The U.S. Environmental Protection Agency continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems.

Lead: If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of Fresno is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you do so, you may wish to collect the flushed water and reuse it for another beneficial purpose, such as watering plants. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take

to minimize exposure is available from the Safe Drinking Water Hotline or at <http://www.epa.gov/lead>.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline (1-800-426-4791).

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. USEPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

The following tables list all the drinking water contaminants that were tested for during the 2017 calendar year. The presence of these contaminants in the water does not necessarily indicate that the water poses a health risk. Unless otherwise noted, the data presented in this table is from testing done January 1 through December 31, 2017. The State requires us to monitor for certain contaminants less than once per year because the concentrations of these contaminants are not expected to vary significantly from year to year. Some of the data contained in this report, though representative of the water quality, is more than one year old.

CALIFORNIA DRINKING WATER SOURCE ASSESSMENT AND PROTECTION PROGRAM

The City of Fresno Water Division and the State Water Resources Control Board, formally the California Department of Public Health, CaDPH, has completed the California Drinking Water Source Assessment and Protection (DWSAP) Program for water wells operated by the Fresno Water Division. The complete report prepared in 2003 is available for viewing at the Water Division or the State Water Resources Control Board office. Please contact the Water Division at 621-5300 or State Water Resources Control Board at 447-3300 if you are interested in more information regarding this report.

The City operates approximately 260 wells throughout Fresno's 115 sq. mile service area. Given the size and complexity of our system, the DWSAP report is a very large document and even a brief summary would be difficult to include in this Consumer Confidence report. However, two summary data tables are available on the City's website at www.fresno.gov. In the search box type Water Quality Report and you will automatically be routed to the linking page containing the reports.

The multipurpose goal of the DWSAP is to identify ways communities can protect the water supplies, manage their water resources, improve drinking water quality, inform their citizens of known contaminants, and identify known activities and locations that can threaten their supply, and meet regulatory requirements. As an example, the following paragraph lists the contaminating activities and sources which can affect Fresno's drinking water.

Airports-maintenance/fueling areas, apartments and condominiums, automobile-body shops, automobile-gas stations, automobile-repair shops, boat services/repair/refinishing, chemical/petroleum processing/storage, crops, irrigated, dry cleaners, electrical/electronic manufacturing, fertilizer, pesticide/herbicide application, golf courses, historic gas stations, historic waste dumps/landfills, home manufacturing, hospitals, housing-high density, junk/scrap/salvage yards, known contaminant plumes, landfills/dumps, machine shops, metal plating/finishing/fabricating, medical/dental offices/clinics, military installations, motor pools, office buildings/complexes, parks, pesticide/fertilizer/petroleum storage & transfer areas, photo processing/printing, plastics/synthetics producers,

railroad yards/maintenance/fueling areas, rental yards, schools, septic systems-high density, sewer collection systems, transportation corridors-railroads, underground storage tanks-confirmed leaking tanks, utility stations-maintenance areas, veterinary offices/clinics, wastewater treatment plants, wells-agriculture/irrigation, wells-water supply. More information is included in the summary which identifies the affected well(s) and associated activities.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

CONTAMINANTS THAT MAY BE PRESENT IN SOURCE WATER INCLUDE:

Microbial contaminants, such as viruses and bacteria that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife. Inorganic contaminants, such as salts and metals, that can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming. Pesticides and herbicides that may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.

Organic chemical contaminants, including synthetic and volatile organic chemicals that are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, agricultural application, and septic systems. Radioactive contaminants that can be naturally-occurring or be the result of oil and gas production and mining activities.

The U.S. Food and Drug Administration regulations and California law also establish limits for contaminants in bottled water that provide the same protection for public health. Additional information on bottled water is available on the California Department of Public Health website

(<http://www.cdph.ca.gov/programs/Pages/fdbBVW.aspx>)

Table 1: Primary Standards and Unregulated Contaminants

Chemical Table	MCL	PHG (MCLG)	Fresno Average	Range of Detection's	MCL Violation	Last Sampled	Typical source of Contaminant
Volatile Organic Contaminants							
cis-1,2-Dichloroethylene (ug/L) (1)	6	100	0.24	0 - 6.8	NO	2017	Discharge from industrial chemical factories; major biodegradation byproduct of TCE and PCE groundwater contamination
Tetrachloroethylene (PCE) (ug/L) (2)	5	0.06	0.34	0 - 6.3	NO	2017	Discharge from factories, drycleaners, and auto shops (metal degreaser)
Trichloroethylene (TCE) (ug/L)	5	1.7	0.12	0 - 3.4	NO	2017	Discharge from metal degreasing sites and other factories
Synthetic Organic Contaminants							
Dibromochloropropane (DBCP) (ng/L)	200	1.7	27	0 - 170	NO	2017	Banned nematocide that may still be present in soils due to runoff/leaching from former use on soybeans, cotton, vineyards, tomatoes, and tree fruit
Inorganic Contaminants							
Aluminum (AL) (mg/L)	1	0.6	0.086	nd - 0.15	NO	2017	Erosion of natural deposits; residue from some surface water treatment plants
Arsenic (As) (ug/L)	10	0.004	0.7	nd - 5.6	NO	2017	Erosion of natural deposits; runoff from orchards; glass and electronics production wastes
Barium (Ba) (mg/L)	1	2	0.030	nd- 0.15	NO	2017	Discharges of oil drilling wastes and from metal refineries; erosion of natural deposits
Chromium (Total) (ug/L)	50	(100)	0.100	nd - 12	NO	2017	Discharge from steel and pulp mills and chrome plating; erosion of natural deposits
Hexavalent Chromium (ug/L) (3)	10	0.02	2.800	nd - 11	NO	2017	Discharge from electroplating factories, leather tanneries, wood preservation, chemical synthesis, refractory production, and textile manufacturing facilities; erosion of natural deposits
Fluoride (ug/L)	2	1	0.090	nd - 1.9	NO	2017	Erosion of natural deposits; water additive that promotes strong teeth; discharge from fertilizer and aluminum factories
Nitrate (N) (mg/L) (4)	10	10	4	0 - 11	NO	2017	Runoff and leaching from fertilizer use; leaching from septic tanks and sewage; erosion of natural deposits
Perchlorate (ug/L)	6	6	0.020	nd - 3	NO	2017	Historic aerospace or industrial operations associated with rocket propellant, fireworks, explosives, flares, matches and a variety of industries.
Radionuclides							
Gross Alpha (pCi/L)	15	n/a	1.90	nd - 7.55	NO	2017	Erosion of natural deposits
Radium 228 (pCi/L)	5	0.019	1.30	nd - 2.1	NO	2016	Erosion of natural deposits
Uranium (pCi/L)	20	0.5	2.97	0.73 - 6.3	NO	2017	Erosion of natural deposits
Unregulated Contaminants (ICR, UCMR & Misc)							
1,4-Dioxane (ug/L)		n/a	4	nd - 84	n/a	2017	We are required by regulations to monitor for certain unregulated contaminants. This is helpful to the USEPA and DDW for tracking the location of contaminants and whether there is a need for stricter regulations. Several contaminants indicate detected values with a "<" symbol meaning less than. There are two possible reasons for this. First, the Detection Limit for Reporting, the DLR, has not been established by EPA or DDW. Second, for various reasons, the analytical equipment is unable to quantify the value below the stated "less than" value but analysis indicates the contaminant is present. For either reason, the concentration cannot be quantified and the City must assume that a "Fresno Average" is not applicable for this report.
Dichlorodifluoromethane (Freon 12)		n/a	0.24	nd - 19	n/a	2017	
Hexavalent Chromium (ug/L) (5)		n/a	2.8	nd - 11	n/a	2017	
1,2,3-Trichloropropane (TCP) (6)		0.7 ug/L (PHG)	3.900	nd - 72	n/a	2017	
Tert-Butyl Alcohol (TBA)		n/a	0.190	nd - 1	n/a	2017	
Vanadium (total)		n/a	11	nd - 71	n/a	2014	
Bromochloromethane		n/a	0.001	nd - 0.79	n/a	2014	
Chlorate		n/a	204	nd - 970	n/a	2014	
Chlorodifluoromethane		n/a	0.085	nd - 3.8	n/a	2014	
Molybdenum (total)		n/a	0.9	nd - 71	n/a	2014	
Strontium (total)		n/a	97	nd - 510	n/a	2014	
Disinfection Byproducts, Disinfectant Residuals, and Disinfection Byproduct Precursors							
Total Trihalomethanes (TTHM) (ug/L)	80	n/a	4.1	nd - 20	NO	2017	Byproduct of drinking water chlorination
Haloacetic Acids (HAA5) (ug/L)	60	n/a	0.72	nd - 8.8	NO	2017	Byproduct of drinking water chlorination
Chlorine (NAOCL) (mg/L)	4	4	0.77	nd - 1.5	NO	2017	Drinking water disinfectant added for treatment

Table 2: Micro Biological Contaminants

Micro Biological Contaminants					
Over 220 bacteriological samples are collected every month in Fresno's distribution system. In addition, over 300 bacteriological samples are collected from wells and treatment sites.					
Contaminant	Highest No. of Detection's	No. of Months in Violation	MCL	MCLG	Typical Source of Bacteria
Total Coliform Bacteria	3 of 253 or 1.18%	0	5%	(0)	Naturally present in the environment
E.coli	1 of 241 or 0.41%	0	A routine sample is positive for E.coli and a repeat sample is positive for total, fecal or E.coli bacteria	(0)	Human or animal fecal waste

Table 3: Lead and Copper

Lead and Copper samples are collected from wells, the distribution system and from inside residences.								
Contaminant	No. of Samples Collected	90th Percentile Level Detected	No. of Sites Exceeding Action Level	Range of Detections	Action Level	MCLG	No. of Schools requesting lead testing	Typical Source of Contaminant
Lead (ug/L) (Sampled in 2017)	104	0	0	ND	15	0.2	1	Internal corrosion of household water plumbing systems; discharges from industrial manufacturers; erosion of natural deposits
Copper (mg/L) (Sampled in 2017)	104	0.19	0	ND - 0.25	1.3	0.3		Internal corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives

(1) cis-1,2-Dichloroethylene: PS 251 located near Blackstone and Ashlan is being monitored monthly for VOC's. For 2017, the annual average concentration is 5.3 ug/L and is below the MCL of 6 ug/L. However, there was a result above the MCL of 6 ug/L from a sample collected in December 2017. Determination as to whether a well exceeds an MCL for non-acute contaminants such as cis-1,2-Dichloroethylene is based on a running average for a prescribed period of time, typically six months. Therefore a well may have several results above the MCL yet still meet drinking water standards. Some people who use water containing cis-1,2-Dichloroethylene in excess of the MCL over many years may experience liver problems.

(2) Tetrachloroethylene (PCE): PS 284 located near Bullard and Moroa in NW Fresno is being monitored monthly for VOC's. For 2017 the average concentration remained below the MCL of 5 ug/L. However, there were a few results above the MCL collected in the latter half of 2017. Determination as to whether a well exceeds an MCL for non-acute contaminants such as PCE is based on a running average for a prescribed period of time, typically six months. Therefore, a well may have several results above the MCL yet still meet drinking water standards until the average exceeds the MCL. Also, because of rounding, exceeding the MCL for PCE would not occur until the average reaches 5.5 ug/L. Some people who use water containing PCE in excess of the MCL over many years may experience liver problems, and may have an increased risk of getting cancer.

(3 & 5) Hexavalent Chromium was a regulated contaminant in the State of California for a period of time during 2017 but the regulation was withdrawn on September 11, 2017. A single sample was collected from Well 105 near Shaw and Freeway 99 in W Fresno. Additional samples were collected while confirmation testing was underway when the MCL was rescinded. No more testing has been done since that time and the well remains in service. Some people who drink water containing hexavalent chromium in excess of an MCL over many years may have an increased risk of getting cancer.

(4) Nitrate: Well 8A near Shields and Clovis has elevated nitrate and is tested regularly. A single result of 11 mg/L was detected in a sample collected in June but follow-up testing averaged below the MCL and the well remained in service. Infants below the age of six months who drink water containing nitrate in excess of the MCL may quickly become seriously ill and, if untreated, may die because high nitrate levels can interfere with the capacity of the infant's blood to carry oxygen. Symptoms include shortness of breath and blueness of the skin. High nitrate levels may also affect the oxygen-carrying ability of the blood of pregnant women.

(6) 1,2,3-Trichloropropane (TCP): In 2017, TCP was detected in 58 wells in Fresno. The State Water Resources Control Board completed the new regulation for 1,2,3-TCP that would be allowable in potable water. The new MCL for TCP is 5 ng/L or 5 parts per trillion and became effective in December 2017. The regulation allows utilities to begin compliance testing in 2018. All samples collected from Fresno wells in 2017 were collected while TCP was still an unregulated compound with a notification level and is therefore being reported in this CCR. Some people who use water containing TCP in excess of the notification level over many years may have an increased risk of getting cancer, based on studies in laboratory animals.

Table 4: Secondary Standards Contaminants List

Secondary standards are based on aesthetic factors (taste, appearance and odor, etc.) and are not health related.						
Inorganic Contaminants	SMCL	Fresno Average	Range of Detection's	SMCL Violation	Last Sampled	Typical Source of Contaminant
Aluminum (ug/L)	200	0.9	nd - 93	NO	2017	Erosion of natural deposits; residual from some surface water treatment processes
Apparent Color (Unfiltered)	15	0.37	nd - 5	NO	2017	Naturally-occurring organic materials
Iron (Fe) (ug/L) (7)	300	9	nd - 430	NO	2017	Leaching from natural deposits; industrial wastes
Manganese (Mn) (ug/L)	50	0.2	nd - 13	NO	2017	Leaching from natural deposits
Odor Threshold (units)	3	0.182	nd - 1	NO	2017	Naturally-occurring organic materials
Sodium (Na) (mg/L)	n/a	26	4.5 - 57	NO	2017	
Specific Conductance (E.C.) (umho/cm+)	1600	325	85 - 940	NO	2017	Substances that form ions when in water; seawater influence
Sulfate (SO4) (mg/L)	500	10.90	nd - 92	NO	2017	Runoff/leaching from natural deposits; industrial wastes
Total Dissolved Solids (TDS) (mg/L)	1000	227	57 - 600	NO	2017	Runoff/leaching from natural deposits
Total Hardness (as CaCO3) (mg/L)	n/a	123	11 - 400	NO	2017	
Turbidity (Lab) (units)	5	0.190	nd - 1.9	NO	2017	Soil runoff
Zinc (Zn) (mg/L)	5	0.001	nd - 0.11	NO	2017	Runoff/leaching from natural deposits; industrial wastes

(7) Iron: One well, 40A, near Annadale and Freeway 99 in SW Fresno had a result that exceeded the Secondary MCL for Iron. Most likely, the iron is related to developing corrosion on the column pipe and well casing, something that is normal for wells that have been offline for a long time. Well 40A was effectively out of service in 2017 but the sample was collected to keep the well current with required testing. The water was flushed to waste rather than into the distribution system. The well remained offline the rest of the year due to mechanical issues and a confirmation sample was not possible. Iron in water may cause discoloration and staining of appliances, fixtures and clothing.

Table 5: Turbidity in North East Fresno related to Surface Water Treatment Plant Operations

	MCL	MCLG	Level Found	Range	Sample Date	Violation	Typical Source
Turbidity (NTU)	TT = 1 NTU	n/a	0.181	n/a	7-Sep-17	n/a	Soil runoff
	TT = 95% of samples <0.3 NTU	n/a	100%		Continuous	n/a	
Turbidity is a measurement of the cloudiness of the water determined by the ratio of the intensity of light scattered by the sample to the intensity of incident light. We monitor it because it is a good indicator of the effectiveness of our filtration system.							

Table 5: Turbidity in South East Fresno related to Surface Water Treatment Plant Operations

	MCL	MCLG	Level Found	Range	Sample Date	Violation	Typical Source
Turbidity (NTU)	TT = 1 NTU	n/a	0.180	n/a	17-Mar-17	n/a	Soil runoff
	TT = 95% of samples <0.3 NTU	n/a	100%		Continuous	n/a	
Turbidity is a measurement of the cloudiness of the water determined by the ratio of the intensity of light scattered by the sample to the intensity of incident light. We monitor it because it is a good indicator of the effectiveness of our filtration system.							

ACRONYMS AND ABBREVIATIONS

n/a: not applicable

NTU: Nephelometric Turbidity Unit (a measure of light)

nd: not detectable at reporting limits.

ng/L: nanograms per liter or parts per trillion.

ug/L: micrograms per liter or parts per billion

mg/L: milligrams per liter or parts per million

pCi/L: picocuries per liter (a measure of radiation)

Maximum Contaminant Level (MCL):

The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.

Maximum Contaminant Level Goal (MCLG):

The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the U.S. Environmental Protection Agency.

Public Health Goal (PHG): The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.

Primary Drinking Water Standard (PDWS): MCLs and MRDLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.

Maximum Residual Disinfectant Level (MRDL): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG): The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

Regulatory Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

Treatment Technique: A required process intended to reduce the level of a contaminant in drinking water.

WHERE DOES OUR DRINKING WATER COME FROM?

For Fresno customers, there are two sources of drinking water. One is derived from the Fresno Sole Source Aquifer, a large underground water system that supplies many communities in the San Joaquin Valley. The city operates approximately 260 wells that draw from this aquifer, which can lower the water table. For this reason, Fresno has an aggressive recharge program that is continually finding new places and methods to conduct ground water recharge. Water recharge operations can slow this decline, but with conservation, you can help have a greater impact.

The second source is surface water delivered via Fresno Irrigation District canals and comes from either Millerton or Pine Flat lakes located in the foothills east of Fresno. This water is treated to drinking water standards at either of Fresno's state of the art treatment facilities: the 30 million gallons per day Northeast Surface Water Treatment Facility in northeast Fresno or the 4 million gallons per day T-3 Water Storage and Treatment Facility in southeast Fresno.

WHAT HAPPENS IN FRESNO IF A WELL EXCEEDS USEPA OR STATE BOARD STANDARDS?

If a well violates standards, it would be removed from service and an alternate water supply is provided. In the event a well exceeds standards but must stay in service, customers who receive water from that well would be directly notified by mail or by hand-delivered flyers.